

L. TYPHOON PATSY 14 NOV 0500Z-22 NOV 0500Z

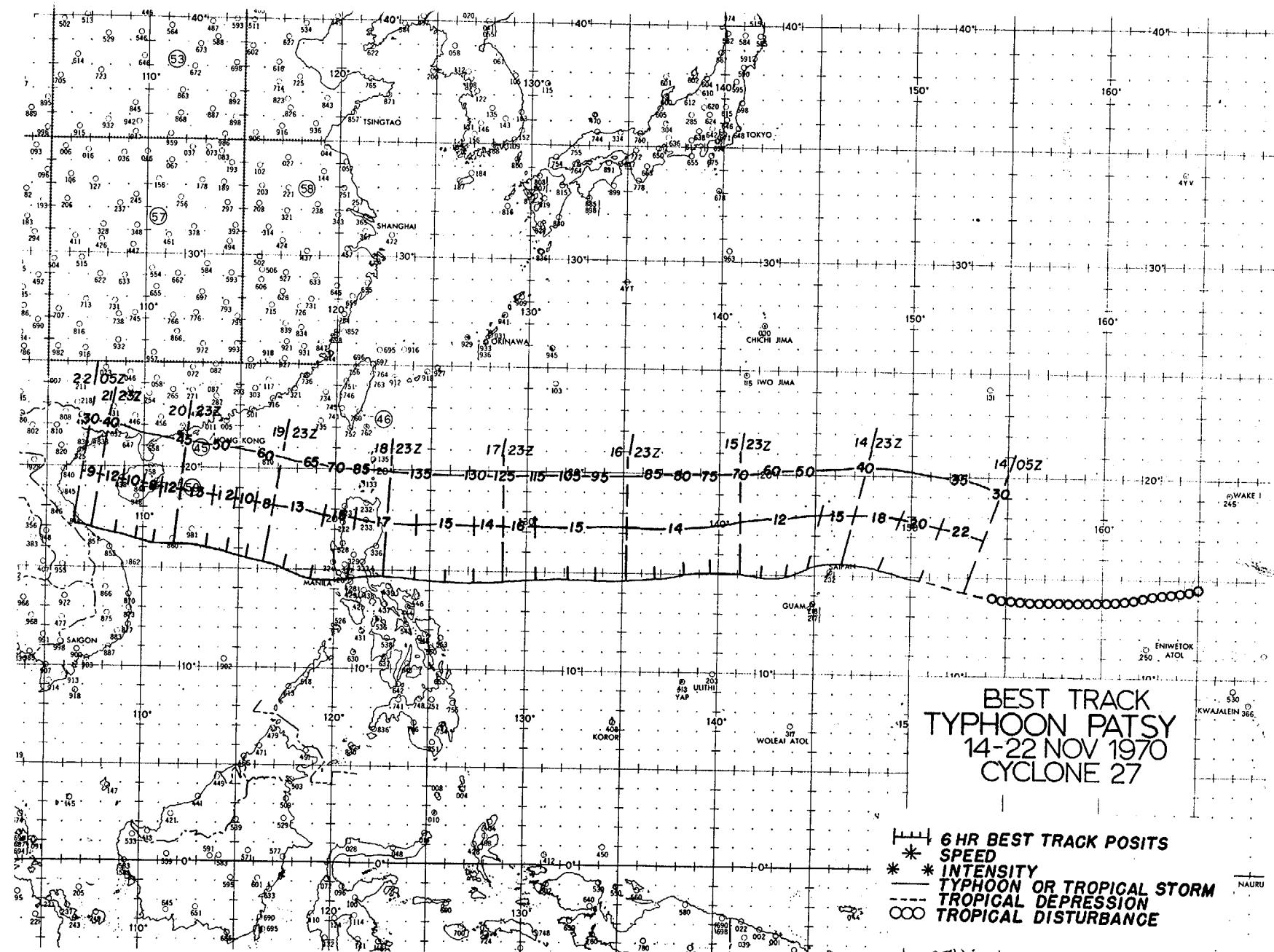
1. STATISTICS

- a. Number of Warnings Issued - 33
- b. Number of Warnings with Typhoon Intensity - 19
- c. Distance Traveled During Warning Period - 2,917 MI

2. CHARACTERISTICS AS A TYPHOON

- a. Minimum Observed SLP - 918 MBS at 18/2200Z
- b. Minimum Observed 700 MB Height - 2256 M at 18/0957Z
- c. Maximum Surface Wind - 135 KTS (From Best Track)
- d. Maximum Radius of Surface Circulation - 600 MI

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3. TYPHOON PATSY NARRATIVE

Culminating a light typhoon season, Patsy showed herself in embryonic form as a disturbance southeast of Wake Island on the 10th of November. Associated with an upper level circulation in the Mid-Pacific trough the system tracked slightly south of west for three days gradually reflecting downward to the surface as a wave trough.

By the 13th satellite photographs from the ESSA-8 and ITOS-1 indicated further development was in process as cloudiness was taking on a more organized character. However, reconnaissance aircraft could locate no closed circulation at the surface, as the speed of translation (22 knots) of the system and the presence of a 200 mb shearline to its north apparently inhibited further intensification.

During the early morning hours of the 14th a surface depression formed just east of the Marianas' chain. Patsy was at the threshold of tropical storm strength as she slowed in forward speed to 12 knots and passed just north of Saipan near noon. The U. S. Coast Guard station on the island indicated a barometer dip to 999 mb and gusts to 30 knots in thunderstorms. (See Figure 5-23 for satellite view sequence of Patsy.)

As development was occurring practically in the backyard of the Joint Typhoon Warning Center on Guam, the opportunity presented itself to view by radar the transformations that were taking place. The FPS-81 (5cm) collocated at Fleet Weather Central began to detect spiral band activity in the afternoon and later indications of a developing eye, as the storm started to move out of range. A reconnaissance aircraft confirmed the following morning that Patsy had attained typhoon force 200 miles west northwest of Guam.

For the next four days, a strong ridge line prevented any meridional component to the typhoon's westward movement at 14 to 15 knots. Luzon now became the target of a third typhoon in as many months.

Approaching the southeastern periphery of a 200 mb anticyclone centered near the Luzon straits, Patsy began a steady reduction in central pressure on the morning of the 17th which increased her maximum winds to super typhoon strength by the following afternoon. Near daybreak on the 19th, a reconnaissance aircraft at 500 mb fixed the 20 mile diameter eye in Luzon's Lamon Bay 105 miles east of Manila. The winds were estimated near 135 knots while a dropsonde reading indicated deepening had bottomed out at 918 mb.

A few hours earlier, the center had passed 40 miles north of the U. S. Coast Guard station on Catanduanes Island. Westerly winds of 90 knots with gusts to 100 knots were experienced while the barometer showed a reading of 975.7 mb.

Arriving ashore by mid-morning Patsy showed little slowdown in forward speed as she roared through the metropolitan area of Manila creating considerable havoc. Calms of varying times up to 35 minutes were reported during her high noon passage. Not since Winnie in June of 1964 had a typhoon so seriously affected the city of Manila.

During the siege the President Taft was torn from its anchorage and collided with the Greek vessel Aliakmon in Manila Bay while the coastal freighter PMI Engineer and a passenger ship of the Philippine President Lines were blown aground.

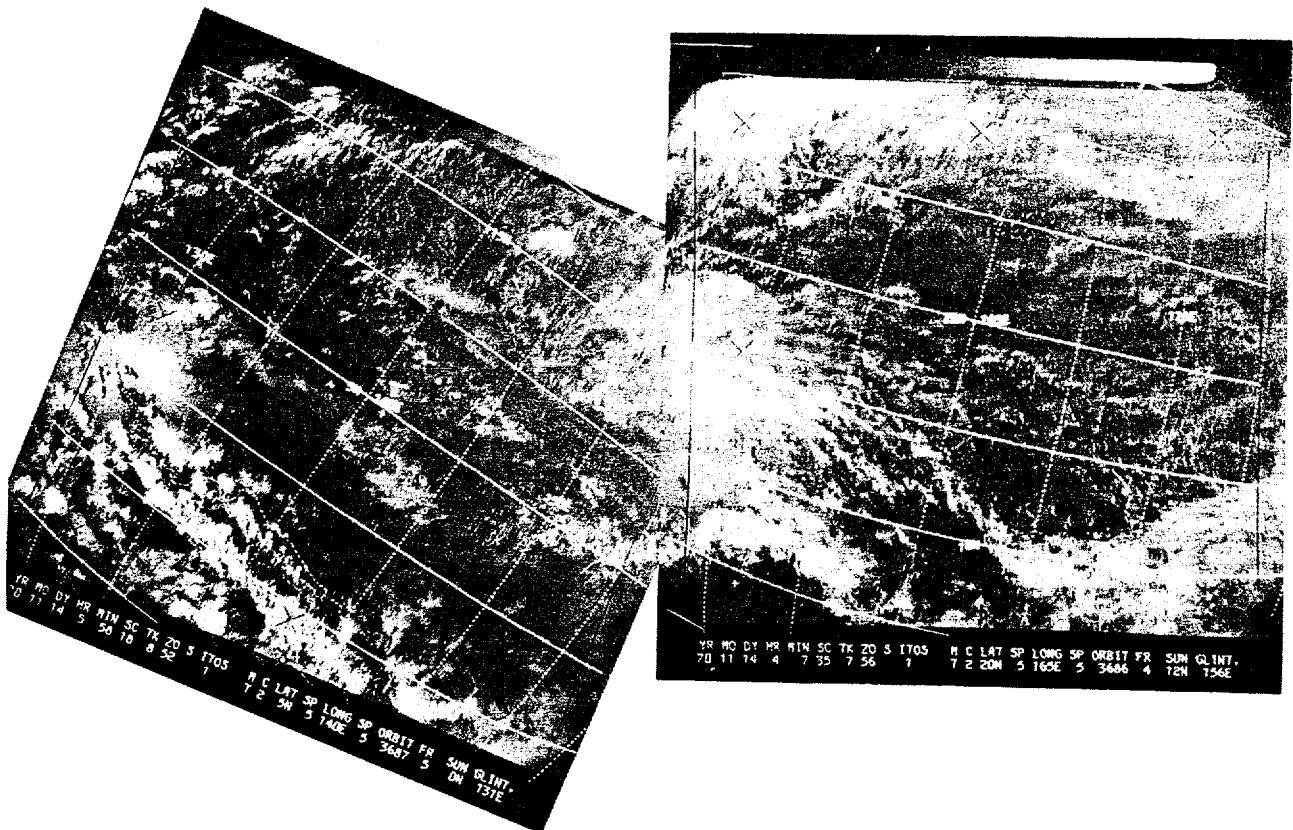
Manila International Airport reported a peak gust to 108 knots with the lowest reported pressure 969.3 mb. Both the Naval Station at Sangley Point on Manila Bay and Naval Air Station at Cubi Point on Subic Bay recorded gusts to 78 knots as Patsy's center passed within 10 miles.

The storm was responsible for 241 deaths and 1,756 injured with an additional 351 reported missing. At least 135 of the deaths occurred at sea. The damage toll incurred was near 80 million dollars (U.S.) as there were an estimated 31,380 refugees in Manila alone whose homes were completely or partially destroyed. Patsy stands on record as the most devastating to strike Manila, since the establishment of the Philippine Weather Bureau in 1865.

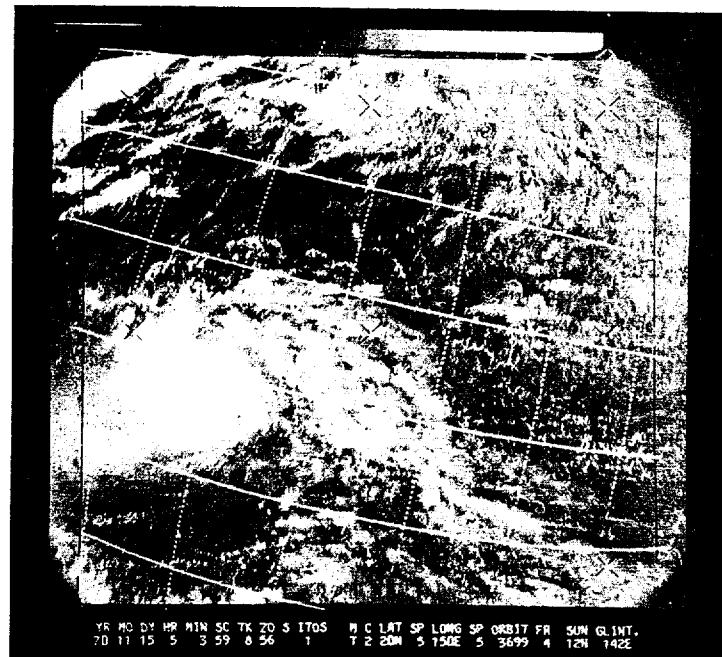
Leaving Luzon, the organized structure of the typhoon had been disrupted by her transit over the rugged islands. Patsy later weakened to tropical storm strength as she moved further into the South China Sea on the 19th. The cooler water and the modifying effect of the northeast monsoon acted as a barrier to any reintensification.

As a small high cell in the Gulf of Tonkin began to give way to a trough in the westerlies, the course of the storm shifted north of west which brought the center inland near the 17th parallel of the Indochina coastline on the 22nd. Quang Tri, just south of where the center struck, reported winds of 35 knots and gusts to 47 knots. Shortly afterwards the circulation broke up and dissipated over the highland region.

FIGURE 5-23 ITOS-1 VIEW SEQUENCE OF TYPHOON PATSY

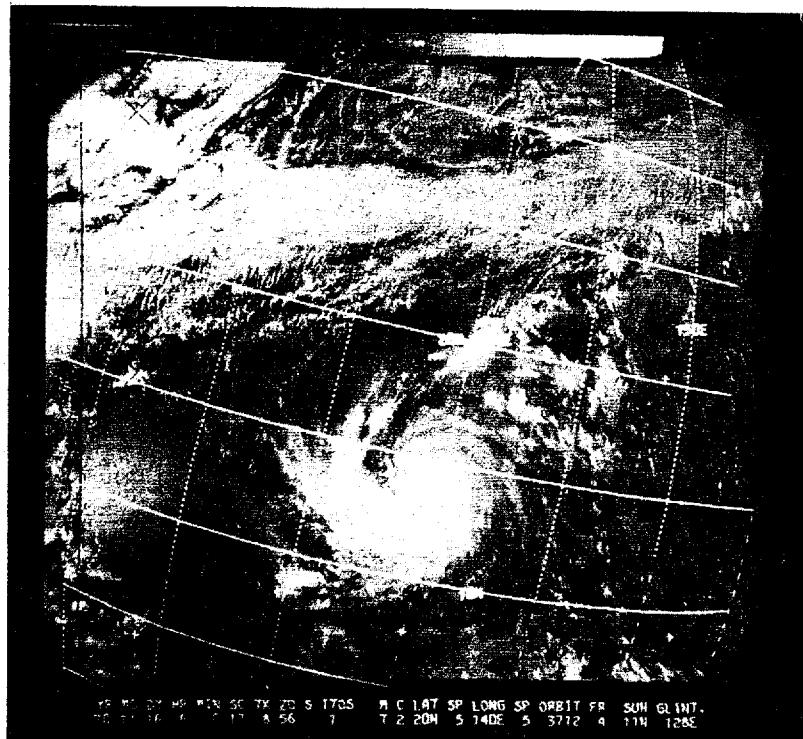


14 NOVEMBER - WAVE STAGE

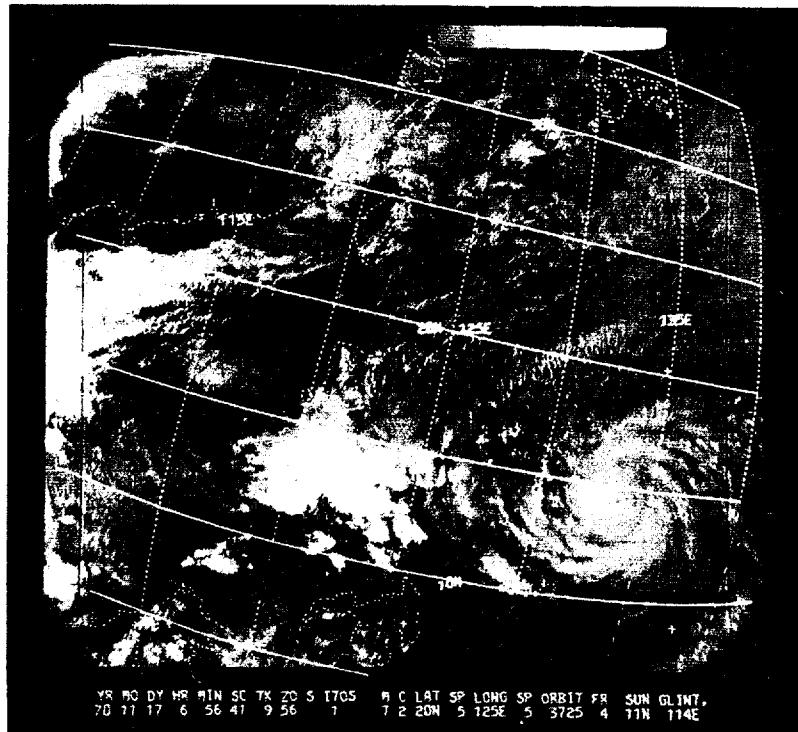


15 NOVEMBER - TROPICAL STORM STAGE

FIGURE 5-23 (CONT.) ITOS-1 VIEW SEQUENCE OF TYPHOON PATSY

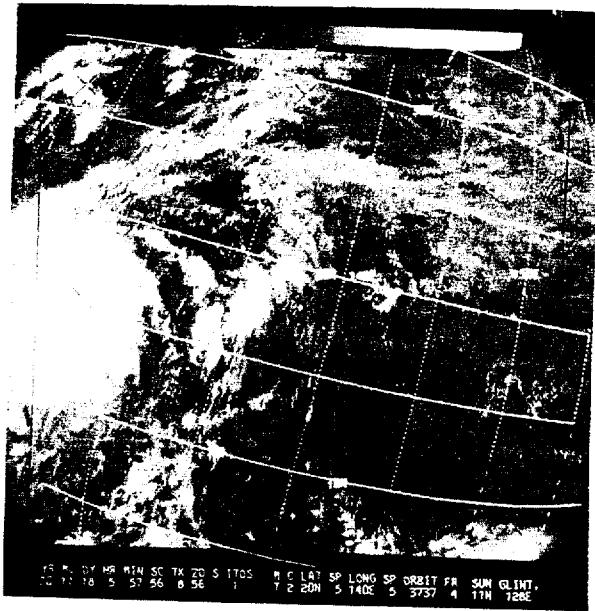


16 NOVEMBER - TYPHOON STRENGTH (75 KT)

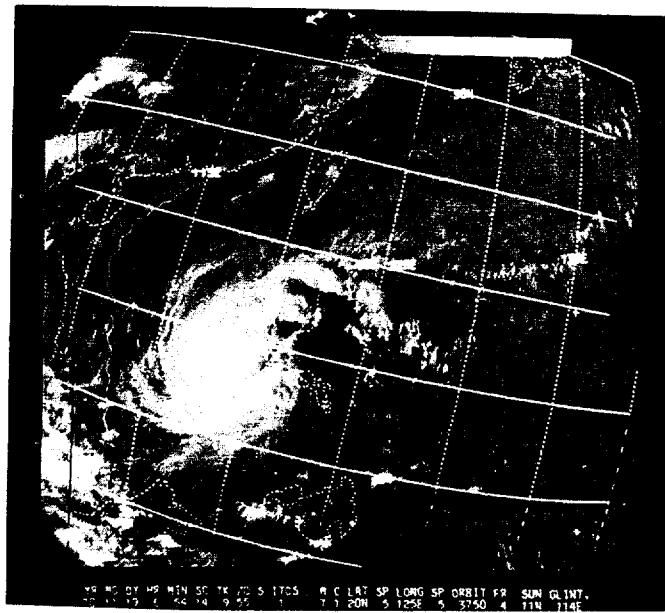


17 NOVEMBER - TYPHOON STRENGTH (95 KT)

FIGURE 5-23 (CONT.) ITOS-1 VIEW SEQUENCE OF TYPHOON PATSY



18 NOVEMBER - SUPER TYPHOON STRENGTH (130 KT)



19 NOVEMBER - TYPHOON STRENGTH (80 KT) - WEAKENED AFTER TRAVERSE OF LUZON.

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TYPHOON PATSY

EYE FIXES CYCLONE

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FIX NO.	TIME	POSIT	UNIT- MET-OD -ACCY	FLT FLT LVL	WDS LVL WHD NIN SLP	DWS SRC MIN 700MB HGT	DWS MIN 700MB LVL TT/TO	FLT LVL FORM	ORIENTA- TION	EYE DIA	CHARACTER WALL CLOUD
1	130506Z	13.0N 159.6E	SLTLS	STG 8	DIA --	CAT -					-----
2	140408Z	13.5N 153.0E	SLTLS	STG X	DIA 03	CAT 2					-----
3	141030Z	14.7N 150.4E	VW-P-20---	0500M	--	028	016	---	25/26	---	-----
4	142030Z	15.3N 147.4E	54-P-05--	700MB	035	040	995	3082	12/11	---	NEG W/C
5	140030Z	15.4N 146.0E	54-P-02--	700MB	--	040	998	3088	14/13	---	W/C DEVLPG SE QUAD
6	150315Z	15.3N 145.3E	54-P-05--	700MB	--	040	998	3075	16/14	---	W/C DEVLPG SE QUAD
7	150504Z	14.5N 145.0E	SLTLS	STG X	DIA 05	CAT 3					-----
8	150633Z	15.0N 144.4E	LND RUR	--	--	--	--	--/--			-----
9	150836Z	15.0N 144.2E	VW-P-06--	--	--	--	--	--/--	CIRC	----	17 WK W/C S-W-NW
10	150945Z	15.0N 144.0E	LND RUR	--	--	--	--	--/--			-----
11	151245Z	14.6N 143.6E	LND RUR	--	--	--	--	--/--			-----
12	151500Z	14.9N 142.9E	LND RUR	--	--	--	--	--/--			-----
13	151518Z	14.8N 143.2E	VW-L-10--	--	--	--	--	--/--	CIRC	----	20 7NM THK, OPEN W
14	152100Z	15.0N 141.6E	54-P-05--	700MB	040	065	986	3021	16/12	CIRC	----
15	160000Z	15.1N 140.8E	54-P-05--	700MB	070	080	990	3018	15/11	CIRC	----
16	160300Z	14.9N 140.0E	54-P-05--	700MB	067	090	989	3008	15/11	CIRC	----
17	160600Z	14.6N 139.7E	SLTLS	STG X	DIA 03	CAT 3					CLSD
18	160759Z	15.3N 138.5E	ACFT RUR	--	--	--	--	--/--			-----
19	161018Z	15.0N 138.3E	VW-P-05--	--	030	--	--	--/--	ELIP	NE-SW	36X17 INTENSE SE & W
20	161450Z	14.8N 137.6E	VW-P-10--	700MB	--	--	2957	19/11	ELIP	NW-SE	12X10 OPEN NW
21	162100Z	14.6N 135.7E	54-P-07--	700MB	000	070	972	2853	16/12	ELIP	NW-SE 18X09 BRKN NRN HALF
22	170300Z	14.7N 134.5E	54-P-05--	700MB	070	080	961	2755	18/12	ELIP	NW-SE 16X12 CLSD
23	170656Z	14.7N 133.5E	SLTLS	STG X	DIA 01	CAT 3					-----
24	170903Z	~ 14.4N 132.5E	VW-P-15--	--	--	--	--	--/--	ELIP	NW-SE	16X08 CLSD
25	171400Z	14.6N 131.5E	VW-P-05--	700MB	--	940	2582	17/12	ELIP	N-S	16X08 CLSD
26	172100Z	14.3N 129.2E	54-P-05--	700MB	102	--	930	2475	20/13	CONC	30-08 OUTER-CLSD, INNER-CLSD
27	1H0300Z	14.6N 127.9E	54-P-03--	700MB	080	120	922	2402	22/12	ELIP	NW-SE 25X15 CLSD, 5-8NM THK
28	1H0600Z	14.0N 127.0E	SLTLS	STG X	DIA 05	CAT 4					-----
29	1H0800Z	14.6N 127.1E	LND RUR	--	--	--	--	--/--			-----
30	- 1H0957Z	14.2N 126.6E	VW-P-05--	700MB	118	--	916	2256	26/11	CIRC	----
31	181336Z	14.6N 125.7E	LND RUR	--	--	--	--	--/--			CLSD, 6-14NM THK
32	181436Z	14.6N 124.9E	LND RUR	--	--	--	--	--/--			-----
33	181517Z	14.5N 124.8E	VW-P-05--	700MB	080	--	--	--/--	CIRC	----	15 CLSD, 6-15NM THK
34	181536Z	14.6N 124.6E	LND RUR	--	--	--	--	--/--			-----
35	181636Z	14.8N 124.5E	LND RUR	--	--	--	--	--/--			-----
36	181736Z	14.8N 124.2E	LND RUR	--	--	--	--	--/--			-----
37	181836Z	14.8N 123.8E	LND RUR	--	--	--	--	--/--			-----
38	181936Z	14.6N 123.6E	LND RUR	--	--	--	--	--/--			-----
39	182040Z	14.7N 123.2E	LND RUR	--	--	--	--	--/--			-----
40	182200Z	14.5N 123.0E	54-P-03--	500MB	070	095	918	09/-5	CIRC	----	20 CLSD, 5-10NM THK
41	182210Z	14.7N 122.8E	LND RUR	--	--	--	--	--/--			-----
42	182340Z	14.7N 122.6E	LND RUR	--	--	--	--	--/--			-----
43	190100Z	14.6N 122.2E	54-P-01--	500MB	100	100	--	10/-6	CIRC	----	16 CLSD, 10NM THK
44	190115Z	14.7N 122.0E	LND RUR	--	--	--	--	--/--			-----
45	190140Z	14.8N 122.2E	LND RUR	--	--	--	--	--/--			-----
46	190208Z	14.9N 121.5E	LND RUR	--	--	--	--	--/--			-----
47	190225Z	14.8N 121.6E	LND RUR	--	--	--	--	--/--			-----
48	190240Z	14.8N 121.2E	LND RUR	--	--	--	--	--/--			-----

TYphoon Patsy
EYE FIXES CYCLONE

27

FIX NO.	TIME	POSIT	UNIT-MET- -ACCY	FLT	LVL	WND	SFC WND	DRS SLP	MIN HGT	700MB	FLT TT/TO	LVL FORM	EYE	ORIENTA- TION	EYE DIA	CHARACTER WALL CLOUD
49	190325Z	14.9N 121.7E	LND RDR	---	---	---	---	---	---	---	---	---	---	---	---	-----
50	190445Z	14.9N 120.6E	LND RDR	---	---	---	---	---	---	---	---	---	---	---	---	-----
51	190505Z	14.9N 120.6E	LND RDR	---	---	---	---	---	---	---	---	---	---	---	---	-----
52	190635Z	14.6N 120.5E	LND RDR	---	---	---	---	---	---	---	---	---	---	---	---	-----
53	190645Z	14.5N 119.8E	SLTLS SIG X	DIA 03	CAT 4	---	---	---	---	---	---	---	---	---	---	-----
54	190800Z	15.3N 119.4E	LND RDR	---	---	---	---	---	---	---	---	---	---	---	---	-----
55	190830Z	15.3N 119.2E	LND RDR	---	---	---	---	---	---	---	---	---	---	---	---	-----
56	190846Z	14.5N 119.8E	VW-R-1U---	---	---	---	---	---	---	---	---	---	---	---	---	NEG W/C
57	190900Z	15.2N 118.6E	LND RDR	---	---	---	---	---	---	---	---	---	---	---	---	-----
58	191000Z	15.2N 118.6E	LND RDR	---	---	---	---	---	---	---	---	---	---	---	---	-----
59	191045Z	15.5N 118.4E	LND RDR	---	---	---	---	---	---	---	---	---	---	---	---	-----
60	191145Z	15.0N 118.2E	LND RDR	---	---	---	---	---	---	---	---	---	---	---	---	-----
61	191418Z	14.8N 118.1E	VW-P-02---	0300M	071	065	987	---	---	26/22	---	---	---	---	---	NEG W/C
62	192355Z	15.8N 115.5E	VW-R-02---	---	050	---	---	---	---	---	---	---	---	---	---	NO APRNT W/C
63	200200Z	15.4N 115.6E	VW-R-2U---	---	045	045	---	---	---	---	---	---	---	---	---	FRMG W QUAD, 6NM THK
64	200300Z	15.4N 115.7E	54-R-15---	---	---	---	---	---	---	---	---	---	---	---	---	FORMD S-NW
65	200751Z	15.0N 114.0E	SLTLS SIG X	DIA 04	CAT 3	---	---	---	---	---	---	---	---	---	---	-----
66	200917Z	15.5N 114.3E	VW-R-15---	---	---	---	---	---	---	---	---	---	---	---	---	-----
67	200936Z	15.7N 115.0E	VW-P-05---	0500M	040	045	989	---	26/24	CIRC	---	---	30	OPEN N SEMICIR	---	
68	201414Z	15.8N 113.9E	VW-P-03---	700MB	030	---	987	3042	19/12	---	---	---	---	---	NEG W/C	
69	210300Z	15.9N 111.0E	54-P-05---	700MB	040	035	998	3037	13/11	CIRC	---	---	14	WK W/C OPEN S	---	
70	210847Z	16.0N 109.5E	SLTLS SIG X	DIA 03	CAT 2	---	---	---	---	---	---	---	---	---	---	-----
71	210915Z	16.3N 109.7E	VW-P-05---	0400M	047	050	988	---	28/21	CIRC	---	---	10	NEG W/C	---	
72	211152Z	16.3N 109.5E	VW-P-02---	0400M	043	045	996	---	26/23	CIRC	---	---	10	NEG W/C	---	
73	211453Z	16.7N 108.8E	VW-P-03---	0400M	043	040	998	---	26/21	CIRC	---	---	10	NEG W/C	---	

TYPHOON PATSY

TROPICAL CYCLONE 27 -- 11/14/0500Z TO 11/22/0500Z
 POSITION AND FORECAST VERIFICATION DATA

WARN NO.	DTG	WARNING POSIT		BEST TRACK		24 HR FCST LAT	24 HR FCST LONG	24 HR ERROR DEG DIST	48 HR FCST LAT	48 HR FCST LONG	48 HR ERROR DEG DIST	72 HR FCST LAT	72 HR FCST LONG	72 HR ERROR DEG DIST
		LAT	LONG	LAT	LONG									
01	14/0500Z	13.8N	152.7E	14.3N	152.8E	13.8N	146.0E	143-0108	14.9N	140.0E	108-0018	----	----	-----
02	14/1100Z	13.7N	151.0E	14.8N	148.3E	13.9N	144.9E	129-0090	15.4N	138.4E	027-0024	16.0N	133.3E	041-0102
03	14/1700Z	13.8N	149.5E	15.2N	148.3E	14.2N	143.0E	144-0048	15.7N	137.1E	019-0054	----	----	-----
04	14/2300Z	15.4N	146.5E	15.4N	146.4E	15.2N	139.5E	277-0090	16.0N	133.3E	305-0132	16.6N	128.3E	351-0126
05	15/0500Z	15.2N	144.7E	15.3N	144.8E	14.7N	138.2E	258-0078	15.0N	132.9E	293-0042	----	----	-----
06	15/1100Z	14.9N	143.6E	14.9N	143.6E	14.0N	137.9E	186-0060	14.2N	132.8E	129-0042	15.1N	128.3E	077-0150
07	15/1700Z	14.7N	142.9E	14.9N	142.4E	14.1N	139.2E	106-0150	14.0N	135.1E	097-0264	----	----	-----
08	15/2300Z	15.0N	141.1E	15.0N	141.1E	15.0N	135.3E	019-0018	14.7N	130.8E	085-0120	14.7N	126.7E	090-0246
09	16/0500Z	14.9N	139.5E	15.0N	139.6E	14.6N	133.8E	134-0006	14.7N	129.3E	084-0114	----	----	-----
10	16/1100Z	15.0N	138.1E	15.0N	138.1E	14.9N	132.8E	072-0036	14.8N	128.6E	084-0168	14.6N	124.5E	090-0318
11	16/1700Z	14.8N	137.1E	14.8N	136.7E	14.8N	132.2E	083-0096	14.8N	128.0E	087-0216	----	----	-----
12	16/2300Z	14.5N	135.2E	14.7N	135.2E	14.0N	129.5E	125-0048	14.3N	124.6E	100-0126	14.9N	120.5E	095-0240
13	17/0500Z	14.7N	134.0E	14.7N	133.7E	14.7N	128.4E	079-0060	15.2N	123.0E	075-0132	----	----	-----
14	17/1100Z	14.5N	132.0E	14.7N	132.1E	14.7N	126.0E	046-0012	14.9N	121.1E	082-0120	15.1N	116.9E	104-0144
15	17/1700Z	14.5N	130.8E	14.6N	130.5E	14.8N	125.0E	075-0042	14.9N	120.1E	090-0144	----	----	-----
16	17/2300Z	14.5N	128.7E	14.5N	129.7E	15.0N	122.5E	019-0018	14.9N	117.6E	108-0072	14.8N	113.5E	104-0096
17	18/0500Z	14.5N	127.4E	14.5N	127.3E	15.2N	121.3E	040-0042	15.2N	116.2E	119-0048	----	----	-----
18	18/1100Z	14.4N	126.2E	14.5N	125.7E	15.2N	120.3E	064-0078	15.2N	115.4E	119-0060	15.2N	111.3E	126-0120
19	18/1700Z	14.5N	124.4E	14.6N	124.2E	15.2N	118.5E	070-0048	15.2N	113.5E	046-0012	----	----	-----
20	18/2300Z	14.4N	122.8E	14.7N	122.4E	15.0N	116.8E	126-0030	15.1N	111.9E	134-0006	14.9N	107.8E	169-0126
21	19/0500Z	14.9N	121.1E	14.6N	120.7E	15.2N	115.1E	207-0024	15.0N	110.2E	189-0078	----	----	-----
22	19/1100Z	14.6N	119.2E	14.6N	119.0E	14.7N	113.4E	222-0078	14.2N	109.4E	183-0132	----	----	-----
23	19/1700Z	14.7N	117.4E	14.9N	117.6E	14.6N	111.7E	255-0084	13.3N	107.3E	200-0216	----	----	-----
24	19/2300Z	14.7N	115.9E	15.3N	116.3E	14.3N	110.1E	241-0108	----	----	----	----	----	-----
25	20/0500Z	15.2N	115.5E	15.6N	115.4E	14.7N	109.8E	201-0102	----	----	----	----	----	-----
26	20/1100Z	15.7N	114.7E	15.7N	114.4E	16.1N	110.2E	120-0030	----	----	----	----	----	-----
27	20/1700Z	15.8N	113.3E	15.0N	113.2E	15.4N	108.4E	185-0078	----	----	----	----	----	-----
28	20/2300Z	15.9N	111.9E	15.2N	111.8E	----	----	----	----	----	----	----	----	-----
29	21/0500Z	15.8N	110.5E	16.3N	110.5E	----	----	----	----	----	----	----	----	-----
30	21/1100Z	16.3N	109.4E	16.4N	109.6E	----	----	----	----	----	----	----	----	-----
31	21/1700Z	16.6N	108.5E	16.7N	108.6E	----	----	----	----	----	----	----	----	-----
32	21/2300Z	16.8N	107.5E	17.0N	107.3E	----	----	----	----	----	----	----	----	-----
33	22/0500Z	17.1N	106.4E	----	----	----	----	----	----	----	----	----	----	-----

AVERAGE 24 HOUR ERROR - 0061 MI.
 AVERAGE 48 HOUR ERROR - 0101 MI.
 AVERAGE 72 HOUR ERROR - 0166 MI.

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